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IS : 673 - 1987

*Indian Standard*  
SPECIFICATION FOR  
CLOTH, WOOLLEN, TWILL, DYED  
( *Third Revision* )

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BUREAU OF INDIAN STANDARDS  
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*Indian Standard*SPECIFICATION FOR  
CLOTH, WOOLLEN, TWILL, DYED( *Third Revision* )

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*Indian Standard*SPECIFICATION FOR  
CLOTH, WOOLLEN, TWILL, DYED( *Third Revision* )

## 0. F O R E W O R D

**0.1** This Indian Standard ( Third Revision ) was adopted by the Bureau of Indian Standards on 8 June 1987, after the draft finalized by the Wool and Wool Products Sectional Committee had been approved by the Textile Division Council.

**0.2** The present revision of the standard has been taken up in the light of the experience gained since its last revision in 1973.

**0.3** In the present revision, the following major changes have been made:

- a) Requirement for mothproofing has been modified;
- b) Requirements for 'wool content percent' and 'pH value of aqueous extracts' have been introduced;
- c) For colour fastness to washing requirement, the 'staining on adjacent fabric' and for colour fastness to drycleaning requirement the 'staining of the solvent' have been introduced;
- d) For breaking strength test, the 'Ravelled Strip' test has been prescribed; and
- e) Number of objectionable flaws in a piece have been modified.

**0.4** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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\*Rules for rounding off numerical values (*revised*).

## 1. SCOPE

**1.1** This standard prescribes the constructional particulars and other requirements of cloth, woollen, twill, dyed.

**1.2** This standard does not specify the indeterminable characteristics like general appearance, feel, finish and shade of cloth (*see also 4*).

## 2. MANUFACTURE

**2.1** The particulars regarding the grade of wool, count of yarn, weave, method of dyeing and finishing for the manufacture of the cloth are given in Table 1.

**2.2 Yarn**—The yarn shall be spun on woollen system.

**2.3 Cloth**—The cloth shall be clean, scoured, and free from grease, soap filling or any other admixture which might give fictitious weight, substance or firmness.

**2.3.1** The cloth shall be uniformly woven with firm selvedges.

**TABLE 1 MANUFACTURING PARTICULARS OF CLOTH,  
WOOLLEN, TWILL, DYED  
( Clause 2.1 )**

FINENESS GRADE OF WOOL* (see NOTE)	APPROXIMATE COUNT OF YARN [ UNIVERSAL COUNT ( METRIC COUNT ) ]		WEAVE	METHOD OF DYEING	TYPE OF FINISH
	Warp	Weft			
(1)	(2)	(3)	(4)	(5)	(6)
48s	180 tex (Nm 5.5)	180 tex (Nm 5.5)	2/2 Twill	Piece dyeing	Milled fin. <sub>g</sub> h

**NOTE**—Polyamide or polyester fibres may be used in admixture of indigenous wool to the extent of 10 to 15 percent, if agreed to between the buyer and the seller.

\*For determination of fineness grades of wool, a reference may be made to IS : 5910-1977 'Specification for fineness grades of wool (*first revision*)'.

**2.3.2.** In case the cloth is to be mothproofed, the same shall be rendered mothproof by suitable mothproofing chemicals which will not have toxic effect on human body and the manufacturer should declare by which chemical the mothproofing has been done and the minimum residual percentage of mothproofing chemical in the fabric as well as the suitable method of test for determining the same.

**NOTE**—The active constituents of some of the commonly used mothproofing chemicals are as follows:

- a) Chloro-2-chloromethyl sulphonamide diphenyl ether derivative ( CCSD );
- b) Halogenated diphenyl urea derivative; and
- c) 2-trifluoromethyl-4-( 2, 4, 5-trichlorophenoxy )-5, 7-dichlorobenzimidazol.

**2.3.3** The cloth, when visually examined against light and on a surface, shall not have more than 12 objectionable flaws in a full length piece. However, in 25 percent of the pieces in the lot up to a maximum of 16 objectionable flaws per piece may be permitted. The objectionable flaws shall be those which strike immediately the eyes of the person examining the cloth and shall be deemed to include the following:

- a) Missing ends and picks;
- b) Floats;
- c) Cuts and holes;
- d) Stains;
- e) Weft bars and warp section marks;
- f) Big slubs, knots and specks, unless they are a part of the design;
- g) Prominently noticeable thick and thin places; and
- h) Dyeing defects ( streaks, patches, etc ).

**2.3.3.1** All objectionable flaws shall be marked by means of a thread of a contrasting shade sewn in the selvedge opposite the flaw. An allowance of 10 cm shall be given for each flaw up to 12 flaws in the piece. However, in case of pieces having flaws exceeding 12 and up to 16, an allowance of 2.5 cm for each such flaw shall be given.

**2.3.3.2** A reference may be made to IS : 4125-1987\* for details of these defects.

### **3. REQUIREMENTS**

**3.1.** The constructional particulars of cloth shall conform to those given in Table 2.

**3.2** The other requirements of cloth shall conform to those given in Table 3.

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\*Glossary of terms pertaining to defects in fabrics ( *first revision* ).

**TABLE 2 CONSTRUCTIONAL PARTICULARS OF CLOTH,  
WOOLLEN, TWILL, DYED**  
( Clause 3.1 )

ENDS/ dm	PICKS/ dm	MASS g/m <sup>2</sup>	BREAKING STRENGTH ON 15 × 20 cm RAVELLED STRIPS, Min		LENGTH ( see NOTES 1 AND 2 )	WIDTH ( EXCLUSIVE OF SELVED- GES ), Min
			Warp	Weft		
			(4) N	(5) N		
125	110	510	1 175	1 080	36 and above	140
Tolerance, Percent	± 5	± 5	± 5	—	—	—
Method of IS : 1963-1981* Test	IS : 1964-1970† (Method A)	Appendix A	IS : 1954-1969‡			

NOTE 1—The number of short length pieces ( measuring not less than 10 m ) shall not exceed 5 percent of the total number of pieces in the lot.

NOTE 2—The cloth woven on handloom shall have a piece length of 25 metres and above.

\*Methods for determination of threads per unit length in woven fabrics ( second revision ).

†Methods for determination of weight per square metre and weight per linear metre of fabrics ( first revision ).

‡Methods for determination of length and width of fabrics ( first revision ).

#### 4. SEALED SAMPLE

**4.1** If, in order to illustrate or specify the general appearance, feel, shade and finish, etc, of cloth, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

**4.1.1** The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller, and the sealed sample would be replaced at regular intervals for avoiding any change in shade, feel and finish.

#### 5. MARKING

**5.1** The cloth shall be marked with the following:

- a) Name of the material;

- b) The legends 'All Wool' or 'Blended Wool', in latter case the percentage of wool and other fibres be also indicated;
- c) Manufacturer's name, initials or trade-mark;
- d) Length and width of the piece; and
- e) Month and year of manufacture.

**TABLE 3 OTHER REQUIREMENTS OF CLOTH, WOOLLEN, TWILL, DYED**  
(Clause 3.2)

SL NO.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
(1)	(2)	(3)	(4)
i)	Relaxation shrinkage, <i>Max</i> ;		IS : 665-1962*
a)	Warpway	5·0 percent	
b)	Weftway	4·0 percent	
ii)	Colour fastness to:		
a)	Light (see Note )	5 or better	IS : 686-1985† or IS : 2454-1985‡ IS : 3361-1979§
b)	Washing:		
1)	Change in colour	4 or better	
2)	Staining on wool	4 or better	
c)	Dry cleaning ( Vapour phase cleaning ):		IS : 4802-1968
1)	Change in colour	4 or better	
2)	Staining of the solvent	4 or better	
iii)	Wool content percent, <i>Min</i> ( All wool cloth )	99	IS : 8476-1977¶
iv)	Blend percent ( Blended cloth )	( See Note in Table 1 ) 85	IS : 2006-1978**
v)	pH value of the aqueous extracts	5 to 7·5	IS : 1390-1983††

NOTE—In case of dispute, colour fastness to light shall be determined by the method prescribed in IS : 686-1985†.

\*Method for determination of relaxation shrinkage of woven fabrics containing wool.

†Methods for determination of colour fastness of textile materials to daylight (*first revision*).

‡Methods for determination of colour fastness of textile materials to artificial light ( xenon lamp ) (*first revision*).

§Methods for determination of colour fastness of textile materials to washing: Test 2 (*first revision*).

||Method for determination of colour fastness of textile materials to dry-cleaning.

¶Method for determination of wool content in woollen textile materials.

\*\*Methods for quantitative chemical analysis of binary mixtures of protein fibres and certain other fibres (*first revision*).

††Methods for determination of pH value of aqueous extracts of textile materials (*first revision*).

### 5.1.1 The cloth may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

## 6. PACKING

**6.1** The cloth shall be packed in bales or cases in conformity with the procedure laid down either in IS : 32-1971\* or in IS : 741-1971†, as required.

**6.2** Alternatively, the cloth may also be packed as per details given below, when specifically agreed to between the buyer and the supplier:

Each piece of cloth shall be suitably folded in a rectangular form or wrapped on cardboard or strawboard of suitable size and thickness. Each piece then shall be wrapped with polyethylene film of a minimum 40 micron thickness or alternatively kraft paper. The edges of the kraft paper or polyethylene film shall be gummed or sealed. Alternatively, each piece may be tied with a twine at least at two places. Such pieces, in a suitable number, shall then be enclosed in an outer layer of heavy cee jute cloth preferably conforming to IS : 3751-1966‡ to form compact bales. The bales shall be made secure by cross-hooping the steel strips at right angles to both the length and the width of the bale. The gross mass of the bale shall not normally exceed 40 kg.

## 7. SAMPLING

**7.1** **Lot**—The quantity of woollen twill cloth delivered to one buyer against one despatch note shall constitute a lot.

**7.2** The conformity of a lot to the requirements of the standard shall be determined on the basis of the tests carried out on the sample selected from the lot.

\*Code for seaworthy packaging of woollen and worsted yarn and cloth (*second revision*).

†Code for inland packaging of woollen and worsted yarn and cloth (*first revision*).

‡Specification for heavy cee cloth.

**7.3** Unless otherwise agreed to between the buyer and the seller, the number of pieces to be selected at random shall be in accordance with col 1 and 2 of Table 4. To ensure randomness of selection, IS : 4905-1968\* may be used.

**TABLE 4 SAMPLE SIZE AND CRITERIA FOR CONFORMITY**  
(*Clauses 7.3 and 7.4*)

LOT SIZE	SAMPLE SIZE	PERMISSIBLE NUMBER OF NON-CONFORMING PIECES	SUB-SAMPLE SIZE
(1)	(2)	(3)	(4)
Up to 50	5	0	2
51 to 150	8	0	3
151 to 300	13	1	3
301 to 500	20	1	5
501 and above	32	2	5

#### **7.4 Number of Tests and Criteria for Conformity**

Characteristics	Number of Tests	Criteria of Conformity
Ends, picks, mass, width and visual defects	According to col 2 of Table 4	Permissible number of non-conforming pieces not to exceed the corresponding number given in col 3 of Table 4
Length	do	Length of each piece not to measure less than the specified, declared or marked length
Breaking strength	According to col 4 of Table 4	$\bar{X} - 0.4R \geqslant$ specified value
Relaxation shrinkage	According to col 4 of Table 4	$\bar{X} + 0.4R \leqslant$ specified value
Colour fastness	do	All the test specimens satisfy the relevant requirements
Wool content blend percent	do	do
pH value of aqueous extracts	do	do

where

$\bar{X}$ =Average value obtained by dividing the sum of the observed values by the number of test results; and

$R$ =Range, that is, difference between the maximum and minimum in a set of observed values.

\*Methods for random sampling.

## APPENDIX A

(Table 2)

### METHOD FOR DETERMINATION OF BREAKING STRENGTH

#### A-1. CONDITIONING

**A-1.1** Prior to test, the test specimens shall be conditioned for at least 24 hours in a standard atmosphere at  $65 \pm 2$  percent relative humidity and  $27 \pm 2^\circ\text{C}$  temperature (*see also IS : 6359-1971\**).

**A-1.2** The tests shall also be carried out in a standard atmosphere (*see A-2.1*).

#### A-2. PREPARATION OF THE TEST SPECIMEN

**A-2.1** For the purpose of this test, the test specimens of size 300 mm lengthwise and 200 mm widthwise shall be cut in both warpway and weftway directions from each of the sample pieces as selected in column 4 of Table 4. The preparation of the ravelled strip test specimens of size  $150 \times 200$  mm and their number shall be according to 9 of IS : 1969-1985†.

#### A-3. TESTING APPARATUS

**A-3.1** The requirements of tensile strength testing machine used for determining the breaking load of the test specimens shall be according to 7 of IS : 1969-1985†.

#### A-4. JAW FACES AND MOUNTING OF THE TEST SPECIMEN

**A-4.1** The width of the jaw faces of the tensile testing machine shall be at least 170 mm. The mounting of the test specimens shall be according to 8.2.3 of IS : 1969-1985†.

#### A-5. TEST PROCEDURE

**A-5.1** The test procedure shall be according to 10 of IS : 1969-1985†.

#### A-6. CALCULATIONS AND REPORTING

**A-6.1** The calculation and reporting of test results shall be done according to 11 and 12 of IS : 1969-1985†.

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\*Method for conditioning of textiles.

†Methods for determination of breaking load and elongation of woven textile fabrics (*second revision*).

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